CloudTurbine: Streaming Data via Cloud File Sharing, Phase I
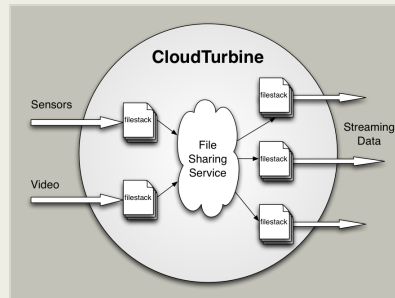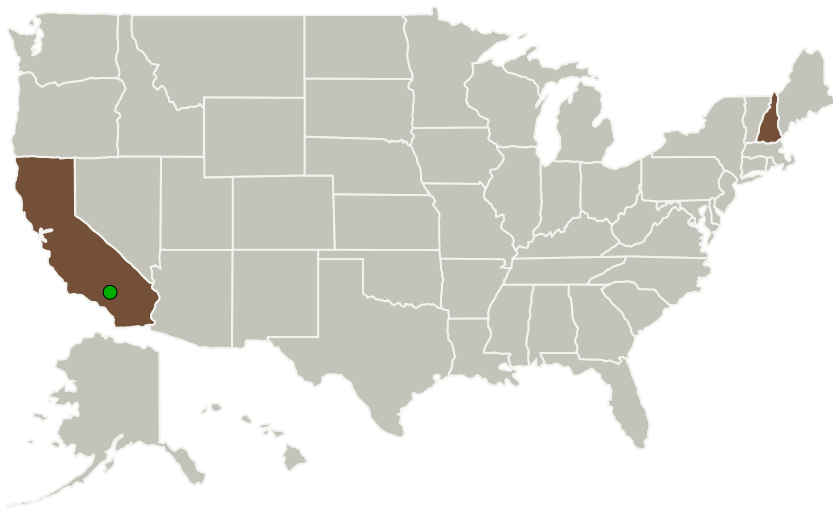
Completed Technology Project (2015 - 2015)

Project Introduction

We propose a novel technology to leverage rapidly evolving cloud based infrastructure to improve time constrained situational awareness for real-time decision making. Our "CloudTurbine" innovation eliminates the distinction between files and streams to distribute live streaming sensor and video data over cloud file sharing services. Streaming and static data have long been considered separately, with unique mechanisms for data transmittal and viewing of each. Files are the greatest common denominator linking static data across all computers. However, real-time streaming data distribution is widely presumed to be sensor-centric; i.e. up-front requirements to "keep up" with live data trump all other considerations. A great unification of cloud based services for static data has recently occurred. There are now many providers of "file sharing" cloud based services. The paradigm for all is simple: (1) put data in a local file folder, (2) it automatically shows up at other linked systems via a cloud service. Wouldn't it be nice if one could unify an approach to streaming data that leveraged this file-sharing cloud infrastructure? That is precisely what we propose. Building upon a functional prototype, we propose to characterize, evaluate, refine and adapt CloudTurbine technology to NASA and commercial applications. CloudTurbine is a streaming data interface to and from standard file sharing cloud services. It delegates much of the data transmittal, security, and server resources to the cloud service provider. It provides robust continuous streaming for high data and frame rates while trading off manageable amounts of delivery latency (on the order of seconds). In so doing, it eliminates the distinction between files and streams, and enables a simple, cost effective new paradigm for streaming data middleware.

Primary U.S. Work Locations and Key Partners

CloudTurbine: Streaming Data via Cloud File Sharing, Phase I

Table of Contents

Organizations Performing Work	Role	Type	Location
Cycronix	Lead Organization	Industry	Laconia, New Hampshire
🟢 Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	New Hampshire

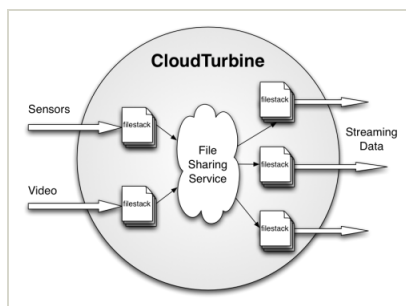## Project Transitions

▶️ **June 2015:** Project Start

✅ **December 2015:** Closed out

Closeout Summary: CloudTurbine: Streaming Data via Cloud File Sharing, Phase I Project Image

Closeout Documentation:
- Final Summary Chart Image*(https://techport.nasa.gov/file/138741)*

Images

Briefing Chart Image
CloudTurbine: Streaming Data via Cloud File Sharing, Phase I
(https://techport.nasa.gov/image/131908)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cycronix

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

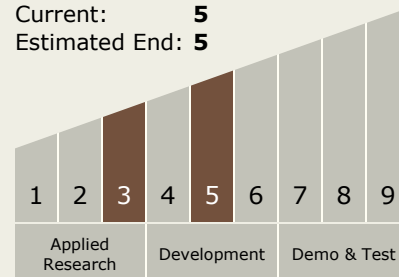Matthew J Miller

Co-Investigator:

Matthew J Miller

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**

1	2	3	4	5	6	7	8	9

Applied Research	Development	Demo & Test

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  └ TX11.6 Ground Computing
    └ TX11.6.8 Cloud Computing

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System